Salinas Valley Groundwater Basin, Paso Robles Area Subbasin

- Groundwater Basin Number: 3-4.06
- County: San Luis Obispo
- Surface Area: 597,000 acres (932 square miles)

Basin Boundaries and Hydrology

The Paso Robles Subbasin is bordered on the north by the Upper Valley Aquifer Subbasin, on the east by the Temblor Range, on the south by the La Panza Range, and on the west by the Santa Lucia Range. The San Andreas fault zone bounds the basin on the northeast. The San Marcos-Rinconada fault system traverses the western part of the basin. The Red Hill, San Juan, and White Canyon faults form the eastern boundary of the subbasin. The subbasin is drained by the Salinas River and Estrella, San Juan, and Huerhuero Creeks. Rainfall averages 15 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater is found in Holocene age alluvium and the Pleistocene age Paso Robles Formation.

Specific yield values in the Paso Robles Subbasin range from 7 to 11 percent, with an average specific yield of 9 percent (Fugro West 2001c). DWR (1958) estimated the average specific yield for the subbasin at 8 percent. DWR (1999) estimated the average specific yield at 15 percent for the alluvium and 9 percent for the Paso Robles Formation.

Alluvium. Holocene age alluvium consists of unconsolidated, fine- to coarse-grained sand with pebbles and boulders. This alluvium provides limited amounts of groundwater and reaches 130 feet thick near the Salinas River, but is generally less than 30 feet thick in the minor stream valleys (DWR 1999). Its high permeability results in a well production capability that often exceeds 1,000 gpm (Fugro West 2001a). Groundwater in Holocene alluvium is mostly unconfined.

Paso Robles Formation. Pleistocene age Paso Robles Formation, which is the most important source of groundwater in the subbasin, is unconsolidated, poorly sorted, and consists of sand, silt, gravel, and clay (DWR 1979). This formation reaches a thickness of 2,000 feet and groundwater within it is generally confined (DWR 1958).

Restrictive Structures

The Rinconada fault zone forms a leaky barrier that restricts flow from the Atascadero portion of the subbasin to the main part of the Paso Robles Subbasin (Fugro West 2001a). The San Andreas fault restricts subsurface flow.

Recharge Areas

Natural recharge in the subbasin is derived from infiltration of precipitation, seepage from streams, and return flow from irrigation and other uses (DWR 1958).

Groundwater Level Trends

Hydrographs show that groundwater levels have been steady since 1995 (DWR 1999). Groundwater flow in the subbasin is generally northwestward.

Groundwater Storage

Groundwater Storage Capacity. DWR (1958) estimated the storage capacity to be 3,000,000 af in the zone 100-feet below 1958 static levels. DWR (1975) estimated the total storage capacity at 6,800,000 af. A study by Fugro West (2001a) estimates the total capacity at more than 30,400,000 af. DWR (1975) estimated the usable capacity at 1,700,000 af.

Groundwater in Storage. The estimated groundwater in storage for 1980 was 30,420,822 af (Fugro West 2001a). The estimated groundwater in storage for 1997 was 30,355,508 af (Fugro West 2001a). The average annual groundwater in storage over the 17-year period from 1980 to 1997 was 30,534,535 af (Fugro West 2001c).

Groundwater Budget (Type A)

Recharge is estimated at 47,000 af/yr (DWR 1975). Extractions for 1967 were estimated at 48,000 af (DWR 1975). Budget calculations were done for a 17-year base period from 1980 to 1997 by Fugro West (2001c) using the inventory method. All subsequent averages are from Fugro West (2001c) for the 17-year period. The average subsurface inflow was estimated at 7,500 af and the average subsurface outflow was estimated at 600 af. The average streambed percolation was estimated at 41,800 af. The average amount of percolation from irrigation water was determined to be 2,300 af and the average amount of percolation from precipitation was estimated at 42,400 af. The 17-year average extraction by phreatophytes was calculated at 3,800 af. Groundwater pumpage due to municipal and irrigation demand averaged 7,700 af. Groundwater pumpage from agricultural demand averaged 8,400 af.

Groundwater Quality

Characterization. The predominant cations are calcium and sodium and the predominant anion is bicarbonate (DWR 1981; Fugro West 2001b). Analyses of 48 public supply wells in the subbasin show an average TDS content of 614 mg/L and a range of 346 to 1,670 mg/L.

Impairments. In one study (Fugro West 2001b), 23 of 74 samples collected exceeded one or more of the drinking water standards. The maximum contaminant level for TDS was exceeded in 14 samples (Fugro West 2001b). The maximum contaminant level for nitrate was exceeded in 4 samples (Fugro West 2001b). Analyses of samples from 2 wells near San Juan Creek showed TDS content exceeding the maximum contaminant level (Fugro West 2001b). The Bradley portion of the subbasin had the highest percentage of samples with constituents higher than the drinking water

standards (Fugro West 2001b). Water quality trends indicate an increasing concentration of TDS and chloride in shallow Paso Robles Formation deposits along the Salinas River, and an increasing concentration of chloride in the artesian aquifer in the area northeast of Creston (Fugro West 2001b). Trends also show an increasing concentration of nitrate between the Salinas and Huerhuero rivers in two locations; north of Highway 46 and south of San Miguel (Fugro West 2001b).

Another major problem is the unpredictable occurrence of hydrogen sulfide in the ground water (DWR 1981).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	56	1
Radiological	52	5
Nitrates	58	4
Pesticides	51	0
VOCs and SOCs	51	1
Inorganics – Secondary	56	13

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production characteristics

	Well yields (gal/min)
Municipal/Irrigation	Range: 500 – 3,300 (DWR 1958)
	Total depths (ft)
Domestic	
Municipal/Irrigation	

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
San Luis Obispo County	Groundwater levels	183
	Miscellaneous water quality	NKD
Department of Health Services and cooperators	Title 22 water quality	58

Basin Management

Groundwater management:	The County of San Luis Obispo manages the Paso Robles Groundwater Subbasin
Water agencies	
Public	Paso Robles WD, San Luis Obispo County, Templeton CSD, City of Paso Robles
Private	Atascadero MWC

References Cited

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Additional References

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